

Missouri Assessment Program (MAP) Released Items - Spring 1999

High School Science

(Grade 10)

Packet Contents

From Test Booklet:

Session 1 - Items 6, 7 and 13
"Oh Deer!" – Session 2 - Items 3, 4, 5 and 6

Scoring Guides:

Session 1 - Items 6, 7, and 13
Session 2 - Items 3, 4, 5, and 6



Missouri Department of Elementary and Secondary Education

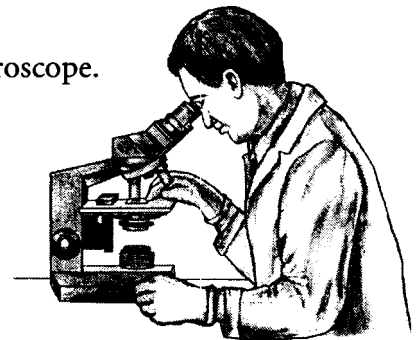


Are mutations always harmful to an organism? Explain your answer.



A cell biologist examined two different animal cells under a microscope. Cell A contained few mitochondria and Cell B contained many mitochondria.

Which one of the cells is more likely to be from a muscle?



Explain your answer.

Go On



A mechanic uses a type of pulley called a block and tackle to lift engines onto the worktable. One job required that an engine weighing 2500 N be lifted 1 meter. Using the block and tackle, the mechanic had to pull with a force of 300 N for a total of 10 meters to lift this engine the required 1 meter.

How much work was accomplished in lifting the engine?

How much work did the mechanic do in lifting the engine?

What was the efficiency of the block and tackle apparatus? You may express your answer as a ratio. You do not need to show the calculations.

Oh Deer!

The Missouri Department of Conservation (MDC) is concerned about a rise in the number of people injured in auto accidents involving deer over the last three years. In most of these accidents, the deer is also injured or killed. The MDC believes this problem is related to the fact that the deer population in Missouri has been increasing.

You have been asked to review the matter and propose recommendations to help the MDC to decide on a course of action to relieve this problem. The MDC has asked you to limit your investigation to a period of three months and to two counties within the state.

What is one limitation that has been imposed by the MDC that you would seek to modify before beginning your investigation? Why?



Other than an increase in the deer population, list four other possible reasons for the increased number of accidents that you feel should be investigated.

2.

3.

4.

Identify three questions that you would want answered to help you understand why the deer population in Missouri has been increasing.

1. _____

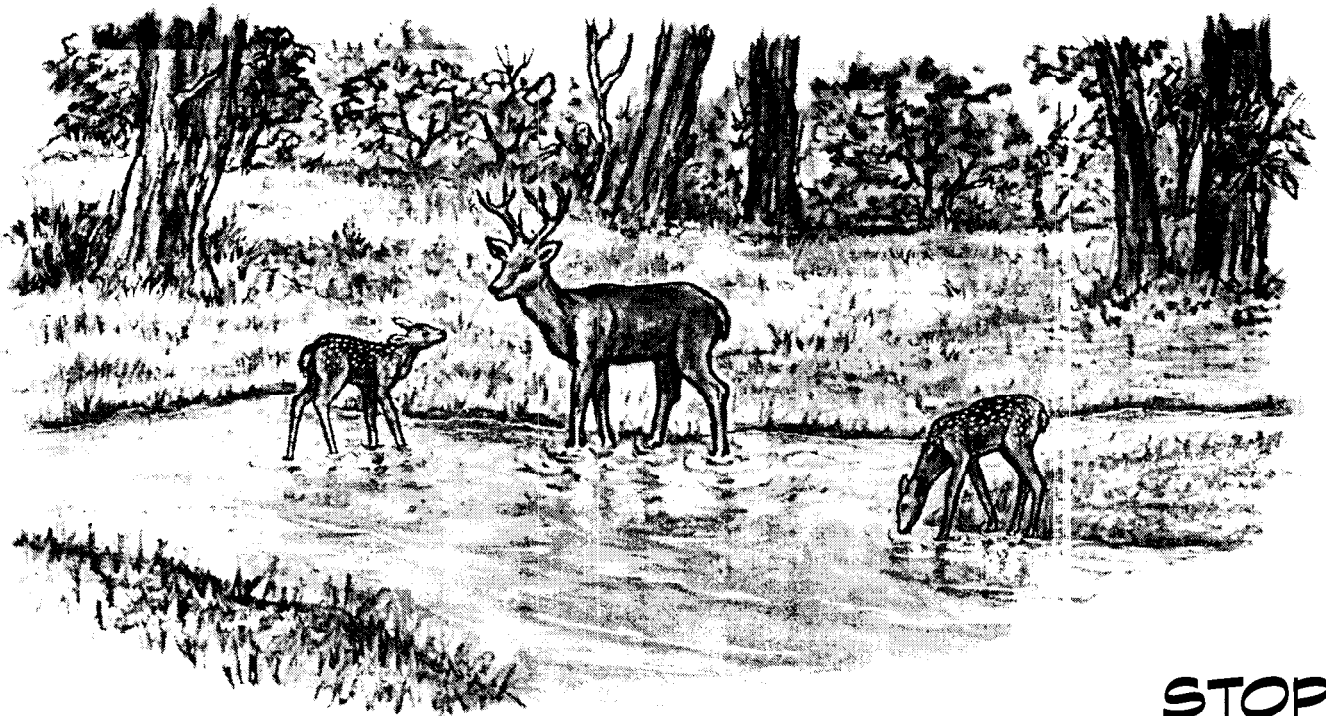
2. _____

3. _____

Assume your investigation finds that the increasing deer population is the **primary** cause of the increase in traffic accidents involving deer. Make two recommendations, other than extending the hunting season, concerning the problem. Your recommendations do not have to eliminate the problem entirely but should provide some relief.

1. _____

2. _____



STOP

Session: 1
Item: 6
Page: 5
Standard: VII.E2.p86
Goals: 1.10

Total Score Points: 1

Key Elements:

No

- Mutations can lead to new features or traits which become adaptations.
 - Mutations can be advantageous and selected by the environment.
 - Mutations may allow an organism to survive.
 - Mutations can have no effect at all (some are neutral).
-

Score Points:

1 point Two key elements
0 points Other

Session: 1
Item: 7
Page: 5
Standard: VII.A2.p82
Goals: 1.10

Total Score Points: 2

Key Elements:

Cell B

-
- any response indicating that mitochondria provide energy / power
 - any response indicating that muscles need energy / power
-

Score Points:

2 points Two key elements
1 point One key element
0 points Other

Session: 1
Item: 13
Page: 9
Standard: IV.C2.p51
Goals: 1.6, 1.10

Total Score Points: 3

Key Elements:

2500 Nm or 2500 Joules

3000 Nm or 3000 Joules

-
- . 2500/3000
 - . 250/300
 - . 25/30
 - . 5/6
 - . 2.5/3
 - . 83%
-

Score Points:

3 points	Three key elements
2 points	Two key elements
1 point	One key element
0 points	One other

Session: 2
Item: 3
Page: 5
Standard: I.A.3.p17
Goals: 2.1, 3.1

Total Score Points: 1

Key Elements:

-
- investigation should be expanded to more / all counties, to get a better perspective throughout the state
 - time constraint should be extended to allow time to study population through current year to see if population trends are continuing
-

Score Points:

1 point Key element
0 points Other

Session: 2
 Item: 4
 Page: 5
 Standard: I.A.3.p17
 Goals: 1.3

Total Score Points: 4

Key Elements:

increase in: human population
 the number of cars being driven
 the number of miles being driven
 the number of roads and highways

increase in the number of miles being driven at the time(s) when deer are on or are crossing roads and highways (dawn / dusk, night / day)

speeding (more people driving faster)
 reckless driving (careless driving)

changes in speed limits in recent years

driving under the influence

driver does not know how to react when they see a deer in the road

inclement weather (rain, snow, fog, etc.) in recent years

loss of deer habitat (so deer are coming into areas with more traffic)
 loss of food source in natural deer habitats (so deer are coming into areas with more traffic)
 residential or commercial development encroaching on natural deer habitats (so more contact with cars)

change in migration

deer adapting to humans

hunters driving deer out of the woods

any reasonable cause for the increase in traffic accidents other than the increase in the deer population

Score Points:

4 points Four key elements
 3 points Three key elements
 2 points Two key elements
 1 point One key element
 0 points Other

Session: 2
Item: 5
Page: 6
Standard: I.B1.p14
Goals: 1.1, 2.1

Total Score Points: 3

Key Elements:

Has **there been any change in** habitat?

Has there been any change in migration patterns?

Has there been any change in gestation period?

Has there been any change in mating habits?

Has there been any change in the predator population which may be causing an increase in the number of deer?

Has there been any change in the birth rate among deer in recent years?

Has there been any change in the death rate among deer in recent years?

Is there an increase in food supply?

Are citizens feeding the deer?

Are citizens planting garden crops that are attractive to deer?

Has there been any change in weather patterns?

Has there been any change in the deer hunting laws, and are the laws being enforced?

Has there been any change in the deer tags issued?

Has there been a decrease in the number of hunters in recent years?

Has there been a decrease in the number of deer taken per hunter?

Any reasonable question about the deer population that might clarify why the deer population has been increasing.

Score Points:

3 points Three key elements

2 points Two key elements

1 point One key element

0 points Other

Session: 2
Item: 6
Page: 6
Standard: II.A1.p22
Goals: 3.1

Total Score Points: 2

Key Elements:

Transport some of the deer to more remote areas of the state where human contact will be less frequent.

Develop large parks on the outskirts of towns where deer can roam freely away from heavy traffic.

Decrease and / or enforce speed limits so that when accidents occur, they won't be as serious.

Develop an educational campaign to inform citizens what plants deer are attracted to and not to feed deer.

Post "Watch for Deer" or "Deer Crossing" signs, etc.

increase natural predation of deer

increase human predation (i.e., incentives to hunt such as reducing fees, regulations, etc...)

assign (professional) bounty hunters

increase number of tags per hunter allowed

build fences

attach deer whistles / horns to cars

mark deer with reflector

Any response offering a reasonable recommendation that logically could lead to a reduction in the deer population in the areas crossed by roads / highways.

Note: no credit for extending hunting season

Score Points:

2 points Two key elements

1 point One key element

0 points Other